

REMARKS/ARGUMENTS

The Pending Claims

Claims 1-12 and 14-16, directed to a method of coating the surface of a substrate, are currently pending. Reconsideration of the pending claims is respectfully requested.

Amendments to the Claims

Claim 1 has been amended with respect to form to correct antecedent basis regarding the term "substrate." In addition, claim 1 has been amended to add the phrase --providing a solution of a polymer having derivatized hydroxyl and/or carboxyl groups and/or CN, halogen, and/or amino substituents in a solvent-- while removing the phrase "a solution ... of a polymer having derivatized hydroxyl and/or carboxyl groups and/or CN, halogen, and/or amino substituents in a solvent." No new matter has been added by way of these amendments.

Claim 13 has been cancelled without prejudice to reinstate and without disclaimer of the subject matter therein.

Summary of the Office Action

Applicants acknowledge, with appreciation, the indication that the earlier rejection predicated on U.S. Pat. No. 3,393,162 (Cox et al.) has been withdrawn.

The Office Action objects to claim 1-16 and suggests that "a substrate," as used in the last line of claim 1, should be amended to read "the substrate." In addition, the Office Action states that should claim 11 be found allowable, claim 13 will be objected to under 37 C.F.R. § 1.75.

The Office Action rejects claims 1, 3-5, 7-8, 10, 12, 14, and 16 under 35 U.S.C. § 102(b) as allegedly being anticipated by EP 0 528 602 (Bugnon et al.). In addition, claim 2 stands rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Bugnon et al. in view of the Marie publication (Marie et al.). Further, the Office Action rejects claim 6 under 35 U.S.C. § 103(a) as allegedly being obvious over Bugnon et al. in view of Peng, *Addition Polymerization* in Encyclopedia of Polymer Science and Engineering, vol. 1, pp. 470-471

(1973) (hereinafter Peng). The Office Action also rejects claims 9 and 15 under 35 U.S.C. § 103(a) as allegedly being obvious over Bugnon et al. in view of U.S. Pat. No. 3,393,162 (Cox et al.). Claims 11 and 13 stand rejected under 35 U.S.C. § 103(a) as allegedly being obvious over Bugnon et al. in view of U.S. Pat. No. 3,884,871 (Herman et al.). Reconsideration of these rejections is respectfully requested.

Discussion of the Objections to the Claims

The antecedent basis objection with respect to the term “substrate” is well taken. Accordingly, Applicants have deleted the term “substrates” in the first line of claim 1 and replaced it with --a substrate--. Applicants have also deleted the term “a substrate” in the last line of claim 1 and replaced it with --the substrate--. In addition, claim 13 has been cancelled to expedite prosecution, thereby mooted any objections thereto. Applicants respectfully request that the objections to the claims be withdrawn.

Discussion of the Prior Art Rejections

To support the rejection of a claim for anticipation, a single prior art reference must teach every element of the rejected claim. See, e.g., M.P.E.P. § 2131. All of the prior art rejections are premised at least in part on Bugnon et al. However, Bugnon et al. does not disclose or suggest (alone or in combination with any other cited reference), *inter alia*, a solvolysis reaction in order to lower the solubility of the polymer in the presence of a substrate as is required by claim 1. At most, Bugnon et al. teaches an adsorption / precipitation process whereby “[a] polyvinyl alcohol may be formed in situ by hydrolysis of a vinyl acetate polymer in a dispersion of the pigment.” However, as explained below, this does not result in the conversion of a polymer (e.g., polyvinyl acetate) to a form showing a reduced solubility by way of solvolysis, as is required in claim 1. Further, the present invention, unlike Bugnon et al., discloses the conversion of a polyvinyl alcohol to a polyvinyl alcohol derivative by way of solvolysis. Moreover, as explained below, the present invention is also distinguishable from an adsorption / precipitation process as is taught by Bugnon et al. The other cited references do not satisfy the deficiencies of Bugnon et al. with respect to the pending claims. As a result, the cited references taken singly or in combination do not meet the recited features of the pending claims because they do not disclose or suggest every element of the rejected claims.

A person of ordinary skill in the art will understand from the disclosure of Bugnon et al. that the underlying mechanism for depositing the polymer on the pigment particle, as taught therein, is adsorption. Such a process is undesirable and in contradistinction with the present invention. The present invention is different because it deposits the polymer on the surface of the substrate by reducing the solubility of the polymer, as explicitly recited in the pending claims. As a result, the present invention is distinguishable from the mere adsorption of Bugnon et al., such that the present invention advantageously allows for better control of polymer deposition on the substrate.

In addition, Bugnon et al. does not teach a solvolysis reaction in order to lower the solubility of the polymer in the presence of a substrate as is required by claim 1. Instead, a person of ordinary skill in the art will understand from the disclosure of Bugnon et al. that a hydrolysis reaction must occur in an aqueous medium. In this respect, a polymer comprising acetate moieties, which are converted in a hydrolysis reaction to hydroxyl groups, will show an increased solubility in an aqueous medium. This is just the opposite of what is required according to the present invention.

In contrast to the mechanism disclosed in Bugnon et al., the mechanism of the present invention provides a controlled coating of the substrate. This allows the thickness of the coating to be predefined. One skilled in the art will appreciate that the mechanism operating in Bugnon et al. will only allow for imperfect or very thin adsorption layers on top of the particles and that this mechanism functions only as long as there are available adsorptive sites on the pigment surface. Once the adsorptive sites on the pigment particles are all blocked by adsorbed polymer, the adsorption mechanism will no longer operate.

It will also be appreciated by one skilled in the art that the suggestion in Bugnon et al. to “precipitate [the polymer] ... onto the pigment particles by addition of a precipitant salt such as sodium chloride or sodium sulphate” is an attempt to achieve thicker layers of deposited polymer on the pigment. This precipitation mechanism of Bugnon et al. is different from the deposition mechanism controlled by the solvolysis reaction according to the present invention. It is noteworthy that the adsorption mechanism of Bugnon et al. is nearly identical with the mechanism proposed by U.S. Patent No. 3,393,162 (Cox et al.), which the Office Action acknowledges is not applicable.

In an effort to more clearly distinguish the present invention from one utilizing precipitation as in Bugnon et al., Applicants have amended claim 1 to read “providing a solution of a polymer having derivatized hydroxyl and/or carboxyl groups and/or CN, halogen, and/or amino substituents in a solvent” to emphasize that the present invention involves “a solution” and not a precipitant or method related thereto. (Emphasis added.)

Although both Bugnon et al. and the present invention suggest the use of polyvinyl alcohol, Bugnon et al. suggests the use of polyvinyl alcohol that is formed in situ by a hydrolysis reaction of polyvinyl acetate. The present invention, on the other hand, suggests the use of polyvinyl alcohol as a starting material that will undergo solvolysis. Thus, the polyvinyl alcohol, as used in the present invention, is converted to a polyvinyl alcohol derivative by way of the solvolysis reaction. The polyvinyl alcohol derivative is then deposited on the surface of the substrate due to reduced solubility. However, as discussed above, Bugnon et al. does not teach the use of polyvinyl alcohol in a solvolysis reaction to produce a derivative thereof that exhibits reduced solubility in the reaction medium.

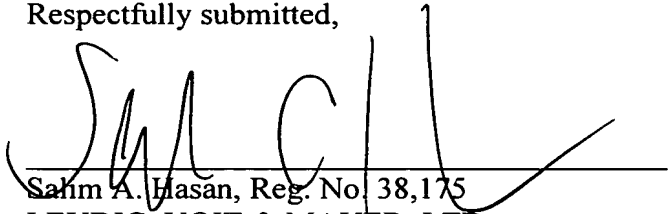
Nothing in Marie et al., Peng, Cox et al., and/or Herman et al. cures the deficiencies of Bugnon et al. relative to the pending claims. In particular, none of these cited references teaches or suggests a method of coating a substrate that involves carrying out a solvolysis reaction on a polymer containing derivatized functional groups so as to alter the solubility of the polymer and cause it to be deposited onto the surface of the substrate.

Since none of the cited references, when viewed alone or in combination, teach or suggest the method of coating a substrate recited in the pending claims, the anticipation and obviousness rejections are improper and should be withdrawn.

Conclusion

Applicants respectfully submit that the present application is in condition for allowance. If, in the opinion of the Examiner, a telephone conference would expedite the prosecution of the subject application, the Examiner is invited to call the undersigned attorney.

Respectfully submitted,

A handwritten signature in black ink, appearing to read 'Sahm A. Hasan', is written over a horizontal line.

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